Risk Management Training – The Key to Avoiding Fatal Accidents

Robert A. Wright
President, Wright Aviation Solutions LLC
June 2012

Topics

- Background on fatal accident causality
- Root causes of fatal accidents
- Risk management – a critical pilot skill
- Role of poor risk management in fatal accidents
- Root cause validation – three case studies
- The need for pilot training reform

Background – Fatal Accident Causality Trends

- The pilot plays a central role in fatal accidents –
  - 63 per cent of non-commercial fatal accidents were pilot related in 2009 (per 2010 Nall Report)
- The fatal accident rate has been flat for 10 years
  - 2001: 1.27 (per 100,000 flight hours)
  - 2010: 1.27
- From 1975 to 2001, the fatal accident rate decreased
  - 1975: 2.19
  - 2001: 1.27 (a **42 per cent decrease**)

Causes of General Aviation Fatal Accidents

- Stated fatal accident causes (2010 Nall Report for 2009)
  - Maneuvering
  - Weather
  - Takeoff and climb

- Are these the real root causes of general aviation fatal accidents?

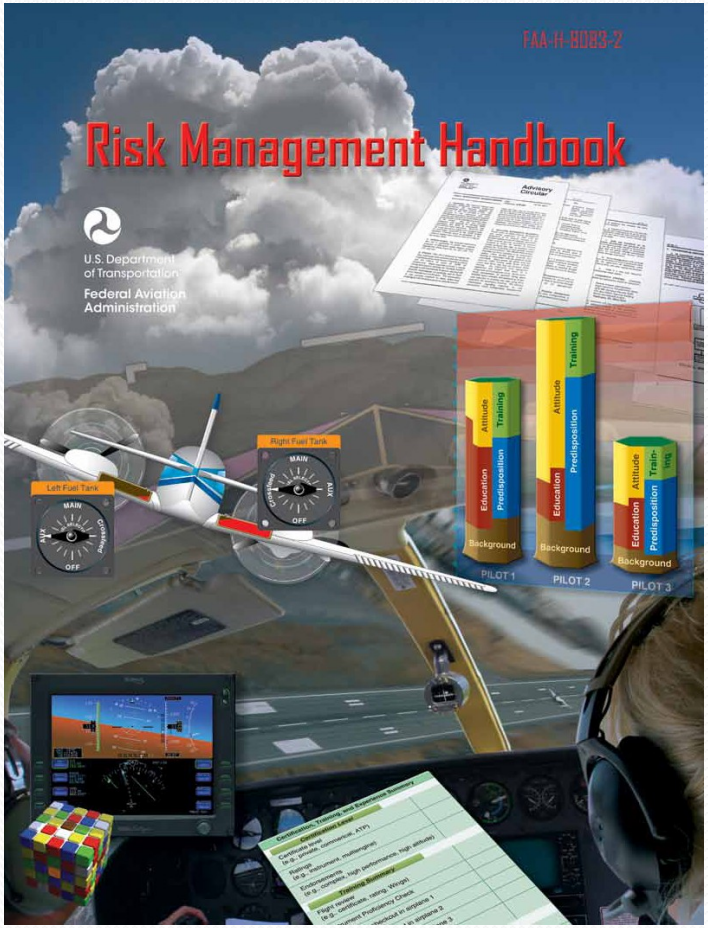
Root Causes of General Aviation Fatal Accidents

- NTSB causes and factors relate to the final incident in the accident chain and related factors
  - i.e. “loss of control”
  - Describes the “smoking hole in the ground”
  - Describes the “what, when, where, who”
- Root cause(s) refers to the underlying factors which better describe the accident
  - i.e. “How” did the pilot “lose control”
  - “Why” did the pilot find him/herself in this situation

Root Causes of General Aviation Fatal Accidents

- Poor risk management is central to understanding the root cause of most general aviation fatal accidents
- Risk management not historically emphasized in general aviation pilot training
- Change began in 2003 – FAA Industry Training Standards (FITS) program
  - Formal FAA doctrine created in 2009 – *Risk Management Handbook*
  - Still not sufficiently emphasized in knowledge tests or practical tests
  - Still not part of most curricula

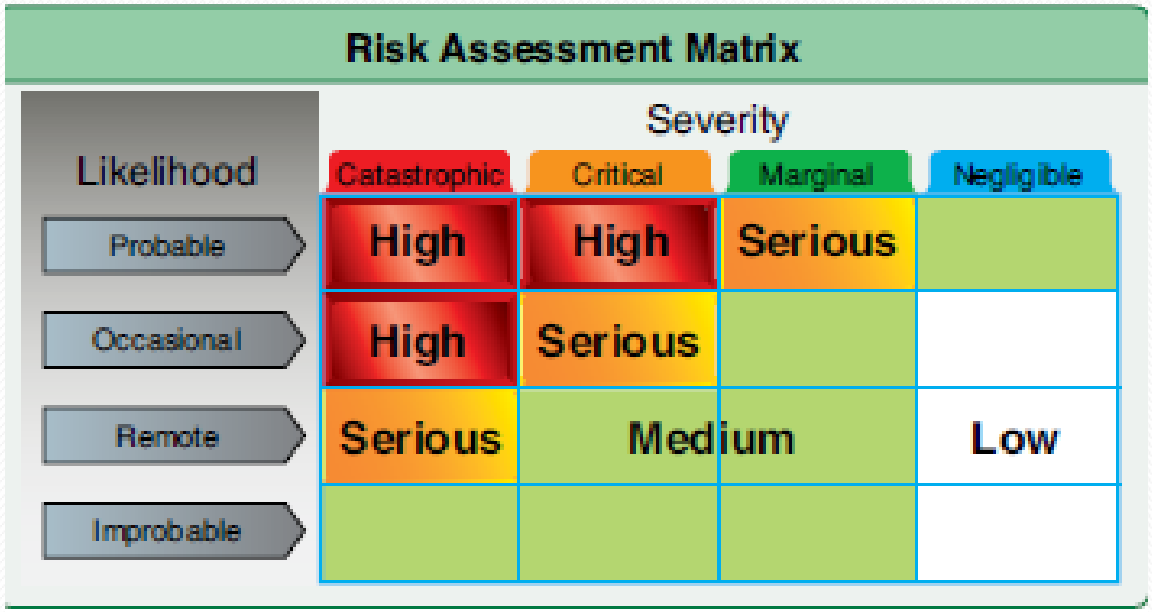
FAA Risk Management “Doctrine”



General Aviation Risk Management Elements

- Identify risk ("PAVE")
  - Pilot ("IMSAFE")
  - Aircraft
  - Environment
  - External pressures
- Assess risk
  - Likelihood
  - Severity
- Mitigate risk

Risk Assessment (continued)



How do you tell if an accident was caused by poor risk management?

- If the pilot could have identified the risk, AND
- If the pilot could reasonably have assessed the risk in terms of its likelihood and severity, AND
- If the pilot could have mitigated the risk through steps to reduce the likelihood and/or severity of the identified risk, AND
- If the pilot failed to accomplish these actions, THEN
- The accident is a “risk management” accident

Arizona Case Study – Results (GA/Personal/Fatal – 2001-2010)

- Accident files with sufficient data– 46
- Apply criteria defining a risk management accident -
- **Risk management accidents – 35 (76%)**
- Other accident causes – 11(24%)
  - Unexpected engine failures – 6
  - Poor basic flying skills – 4
  - Other aircraft failure (fuel leak/fire)- 1

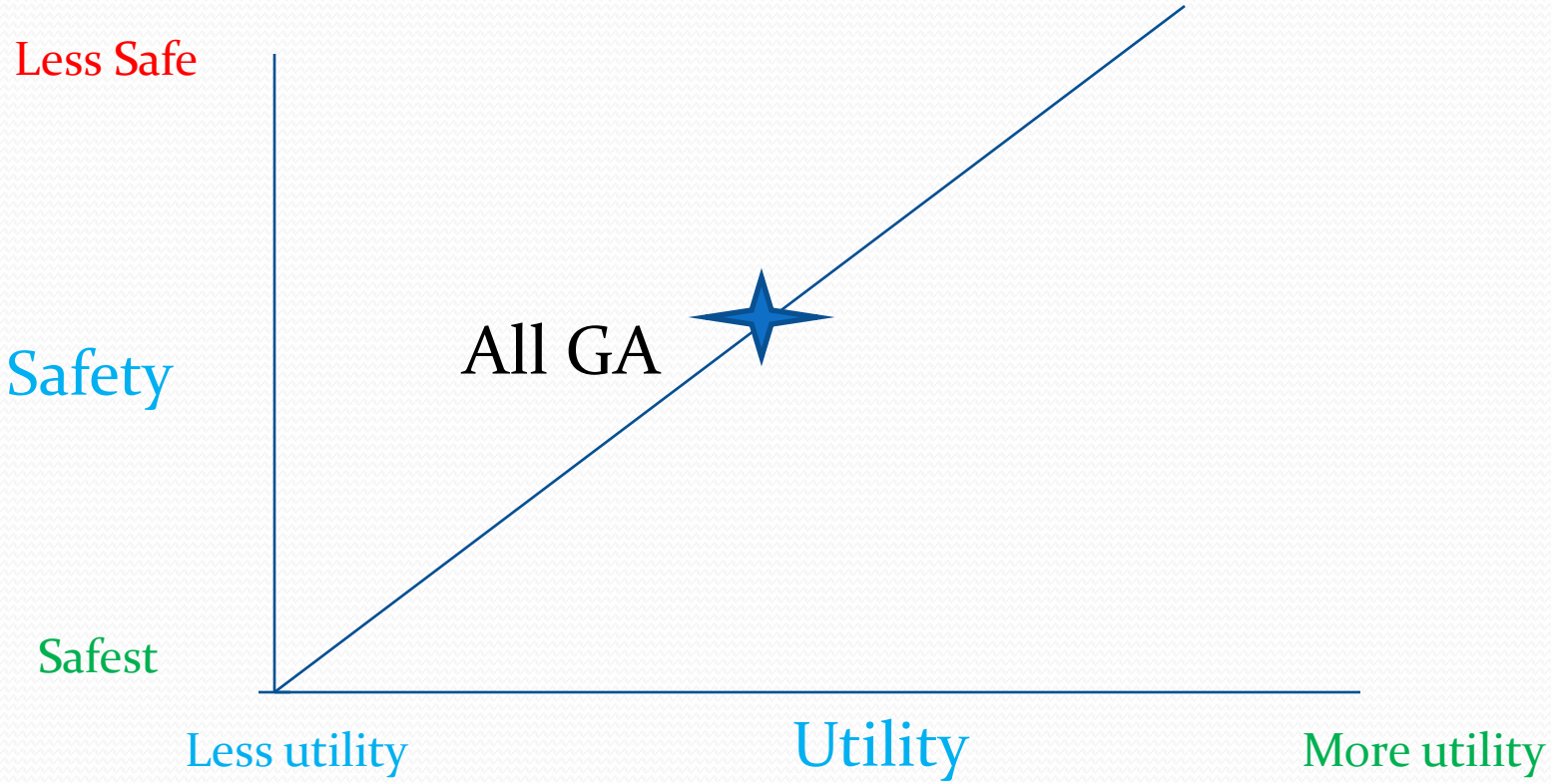
Other Case Studies – Similar Results

- 31 Cirrus fatal accidents through May 2008
  - Risk management root cause – 22 (71 per cent)
- 50 Cirrus, Bonanza (V-tail), Cessna 172 fatal accidents from 2007-2009
  - Risk management root cause – 39 (78 per cent)
    - Cirrus – 70 per cent
    - Bonanza – 67 per cent
    - Cessna 172 – 86 per cent

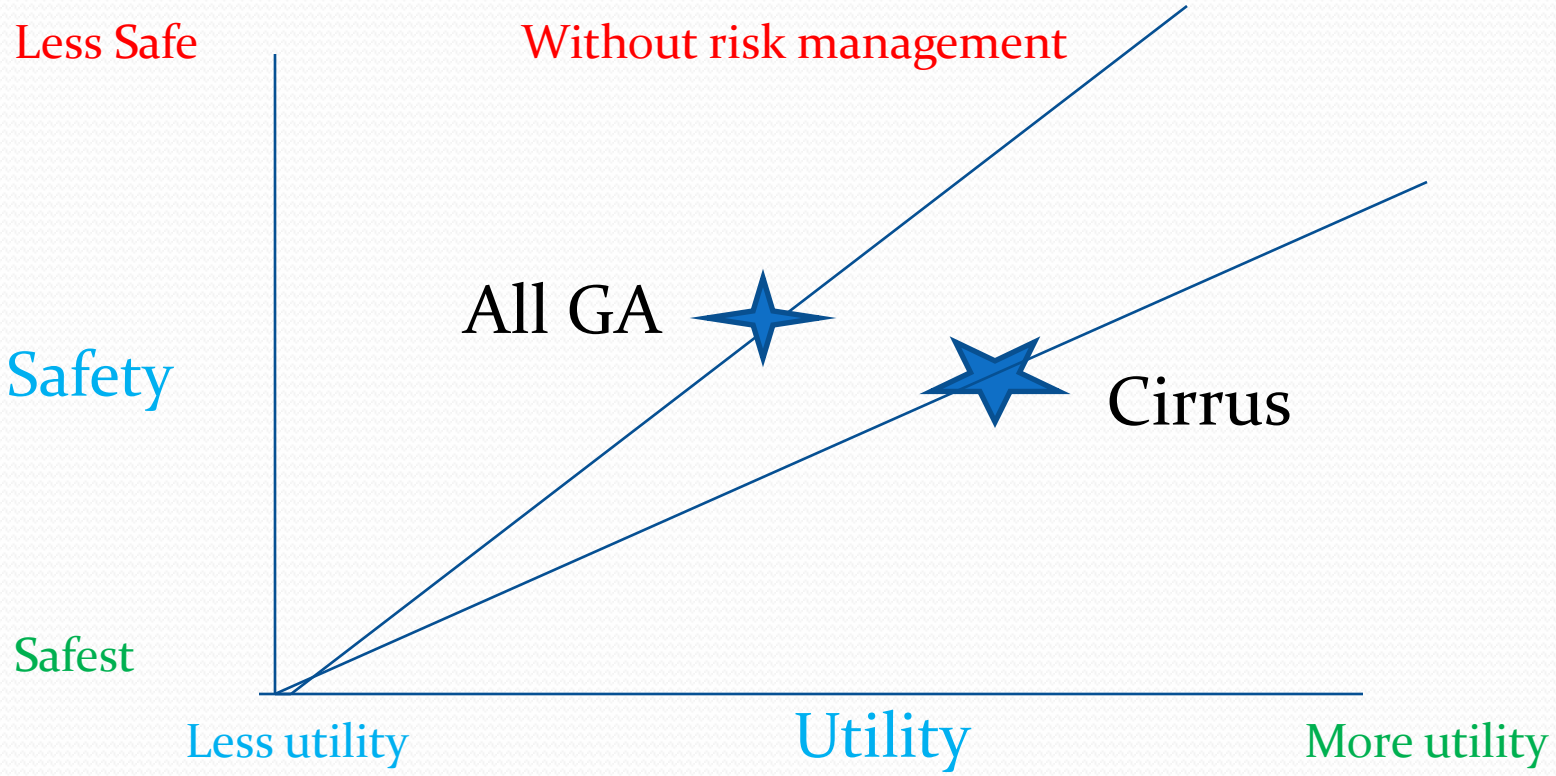
Case Study Conclusions- Why do pilots take these risks?

- Four reasons relate to training and procedures -
- Lack of risk management training
- Failure to continuously apply risk management
- Inaccurate risk assessment
- Inadequate risk mitigation
- Two reasons relate to the prevailing GA culture -
- Higher risk tolerance
- Intentional disregard for risk
- One reason relates to desire for more utility

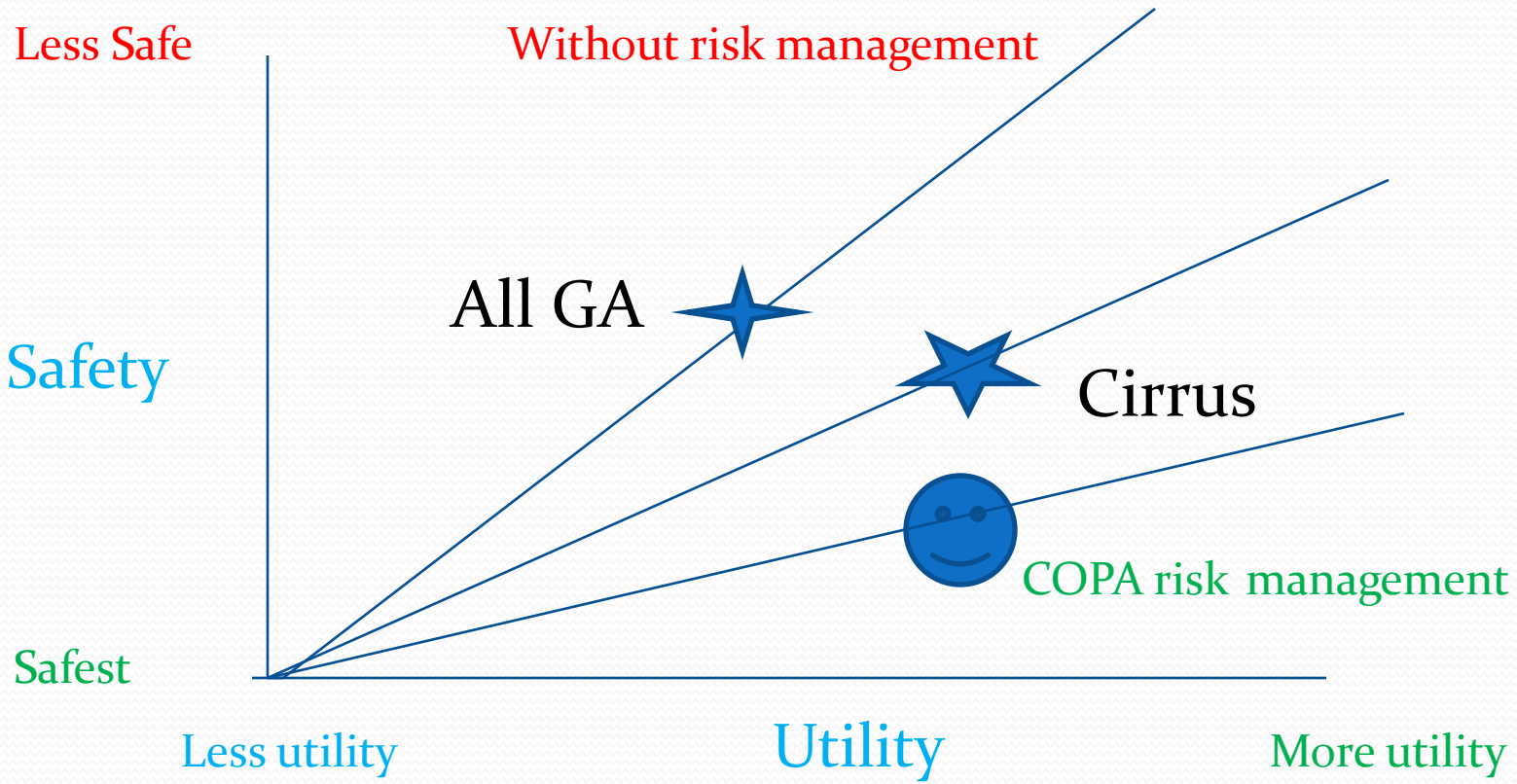
The Safety-Utility Curve



The Safety-Utility Curve – The Cirrus Example



The Safety-Utility Curve – The "Sweet" Spot



Risk Management is Getting More Visibility in GA

- "The one thing that won't change dramatically is the GA accident rate. We … have not conquered the tendency to use our increased capability to allow us to press on when we could not have done so in the past. In other words, we will maintain risk homeostasis. **We will not use the new capabilities to reduce risks, but to increase utility. Risk management will continue to be the biggest GA challenge.**"

John King, KING Schools (Quote from Pro Pilot, May 2010) (Emphasis added)

What needs to happen to reduce GA fatal accidents

- A new approach to root cause accident analysis
- Change GA initial training (20,000 new pilots/year)
  - Emphasize risk management/ other FITS concepts
- Incentivize recurrent training (500,000 current pilots)
  - Better flight reviews
  - Re-structure Wings program
- Industry/FAA leadership and collaboration
  - Promote “culture shift” in training doctrine

Will changes in risk management training happen?

- Current FAA/industry efforts to watch:
  - SAFE Pilot Training Reform Initiative
  - General Aviation Joint Steering Committee (GAJSC)
    - Safety Analysis Team (SAT)
  - Aviation Rulemaking Committee (ARC)
    - Knowledge test requirements

- Major obstacles to training reform
  - Industry resistance to FITS concepts – despite evidence
  - General aviation training and operations culture
  - How to reach existing pilot population